

made. "As I suspected, you've overlooked one important principle."

"What principle?" Brinsmade demanded, intently.

"Classification," answered Prescott. "To get results you must classify machinery and labor. You carried neither far enough."

"Just what do you mean?" asked the perplexed manager.

"Every department in your plant is a little, independent factory," the engineer answered. "In your largest room, I notice, you carry out a dozen operations that are duplicated in other shops—blanking, sorting, assembling, knurling. In fact, I don't remember a single class of work which that room has not tackled within the last three months. In lesser degree the same thing is true of the other departments."

"Yes," Brinsmade granted, "what of it?"

"I am going to show you,"—the other glanced at a tablet in his hand—"that your errors have come from this scattering of operations, this failure to limit each operation to one machine or series of machines. The percentage ratios between departments, productive and non-productive expenses have been accurately figured, yet your failure to classify your work renders these percentages, although accurate, unsafe to use. Let me illustrate. What is the percentage for overhead charge in your big room?"

"Ninety-five per cent," he replied.

"Just so," Prescott hurried on, "and for every dollar paid to the productive help in that room, you charge the customer an additional ninety-five cents, whether the work be running eyelet-machines, or piercing tin washers on a foot press?"

The manager nodded his assent.

"Has it occurred to you," the young man put the question directly, "that ninety-five per cent. was too low for eyelet-machine work, and too high for foot-press work?"

"I can't say that it has," admitted the other reluctantly. "In figuring prices I have simply added to strict production costs the percentage for the room in which the work was done."

"And in consequence," Prescott countered, "you have about as many prices for a single operation as you have departments in the plant. I found several instances of it in these estimates." He picked up two from a number he had brought in with him. "Both of these involve the operation of 'blanking and forming.' In one case you use a non-productive of 95 per cent., in the other 230. Here is another: 'buffing'—65 per cent. on one, 175 on the other. Both prices can't be correct. Whether either is correct remains to be seen. You get my point, I think."

"Yes, I see the logic in what you say," admitted Brinsmade, his eyes dilated by the breadth and newness of the problem.

"Your only course," the young man hurried on, "is to immediately re-arrange your factory departments. Put all your blanking-presses, all your cutting machines together—have all your blanking and cutting-up done in one department. Have all your sorting done at one place."

"Gather all your tool-makers and machinists, now scattered here and there in the different rooms, into one large machine room."

"Then," he swept on, "the non-productive percentages you obtain from the departments so arranged will be true for the class of operations done therein."

The manager nodded comprehension.

"You're right; no question about it," he admitted. "It means tearing the factory to pieces, but there's no

other way. Come on out into the shops and we'll get our bearings. Then we'll work out our programme of change before we move a machine."

V.

Reorganization of the factory was no mere matter of classification, calculation and millwright work. The human element, the reluctance of foremen and job foremen to surrender their virtual independence, promised to be the stumbling block in the way of Brinsmade's programme. Prescott, at the first conference after their joint survey of the shops, suggested as much.

"This must be your personal affair," he told the manager. "For me to mix in it would simply embarrass the work and stir hostility among your bosses. You know them; they have confidence in your judgment and friendship; while I'm an outsider and therefore a theorist and a meddler. So we'll lay out this thing to be done and I'll hike back to town. It's up to you to carry out the changes we decide on."

The second day sufficed for the rearrangement of the shops on paper. When the last pencil sketch of the floor plans had been completed, Brinsmade was master of every detail, had foreseen well nigh every contingency with which he must deal. Prescott's train had hardly started before the manager was facing a meeting of foremen and assistants.

The interest which his account of the discovery of the deficit, the summoning of Prescott and the expert's investigation evoked turned to apprehension as he explained how the cause of the losses had been found and the remedy determined. Opposition he had foreseen; tact and diplomacy, he knew, must mark every step of the reorganization if he was to prevent disorder, confusion and ill will.

"I want you all to feel," he urged, "that you've got a family interest in the changes we are going to make. If the factory can't be put on a sound, paving basis, the company, of course, must close it down. That means no jobs for any of us. I know you've been satisfied with conditions here, and I want to keep you satisfied."

"Give the new plan a chance, help to make it a success. Put your shoulder to the wheel and help us out of the rut we're stalled in. We'll win out, all right, if we just boost together."

A blanking room was the first innovation. It was placed on the ground floor because of the weight of the machine; near the store rooms in accord with his plan to make manufacturing a continuous process, without retrograde movement, from raw material to finished product. Every department was stripped of its punch presses; all were gathered together and a job foreman promoted to boss the room. In the same way, the foot and dial presses were withdrawn from the various shops and concentrated in one place; in turn followed the buffers, the milling and screw machines, the drill presses.

Chagrin followed each of these withdrawals and the shifting of foremen consequent on the establishment of the new rooms, the gradual disintegration of the elder departments robbed of machines and men. Chapman, the brusque, but capable foreman of the largest shop rebelled when his eight tool makers were ordered to the consolidated tool room.

"You may see some sense in all these changes," he complained bitterly, but for my part I think you'll ball things up."

"How's that?" asked the manager.

"Why," gave back the other impetuously, "how do you expect me to turn out goods as I have in the past, when a half-dozen other men, who know nothing about them, are making most of the parts for me? I know